

REMARKS

Claims 1-34 are pending in the present Application. Claims 8-26 and 34 stand withdrawn as being directed to a non-elected invention.

Claims 1 and 27 have been amended to recite that the seed layer is used in the manufacture of integrated circuits. Support for this is found throughout the Specification, such as at page 9, lines 1-2. Claim 27 has also been amended to provide antecedent basis for claims 28 and 33 which depend therefrom. Claims 3, 7, 29 and 33 have been amended to correct grammar and not to overcome any prior art rejection. No new matter is added with this Amendment.

A new title has been required by the Examiner that "is clearly indicative of the invention to which the claims are directed." Applicant respectfully traverses this requirement. The present Application is entitled "Seed Layer Deposition". The pending claims are directed to a "method for depositing a seed layer" and a method of "enhancing a seed layer". Applicant respectfully submits that the title "Seed Layer Deposition" is clearly indicative of the claimed method of depositing a seed layer. Applicant respectfully requests that this requirement be withdrawn.

The Examiner seemed to indicate that the abstract should be amended to recite conductive polymers or seed layers. The abstract has been so amended.

Claims 28 and 33 have been rejected under 35 USC § 112, second paragraph, as being indefinite for failing to point out particularly and claim distinctly the subject matter which Applicants regard as their invention. This rejection is mooted by the present Amendment and Applicants respectfully request that this rejection be withdrawn.

Claims 1-4, 6, 7, 27-30, 32 and 33 have been rejected under 35 USC § 103(a) as being unpatentable over Datta et al. (US 2002/0064592) or Chen (US 6,277,263) in combination with Rapoport et al. (US 5,298,687). Applicant respectfully traverses.

The Datta et al. publication has a filing date of November 29, 2000. Applicant's present Application claims the benefit of U.S. Provisional Application No. 60/243,084, filed on October 25, 2000. Thus, Applicant's priority date is *before* the filing date of the Datta et al. publication. Applicant respectfully submits that the Datta et al. publication is not prior art and should be removed as a reference.

The Chen patent is directed to a method of depositing copper, particularly a method of enhancing a copper seed layer using a metal plating bath, more specifically an alkaline copper electroplating bath. See column 5, lines 11-13. This patent only teaches enhancing a seed layer with the use of *metals or metal alloys*. For example, Chen states at column 3, lines 62-65, that ultra-thin seed layers are enhanced by "depositing additional *metal* thereon in a separate deposition step to provide an enhanced seed layer that is suitable for use in a primary metal deposition." Emphasis added. Further, at column 6, lines 36-42, Chen states "it is understood that the basic principle of the enhancement of an ultra-thin seed layer prior to the bulk deposition thereof can be applied to other *metals or alloys* that are capable of being electroplated." Emphasis added. Thus, there is nothing in Chen that teaches or fairly suggests the use of conductive polymers to repair or enhance a seed layer.

Rapoport et al. disclose a hybrid electrical connection having a crossover connection between circuit patterns on a ceramic substrate. The crossover connection in this patent is a silver filled polymer. This patent fails to disclose or suggest substrates having apertures, and in particular substrates having $\leq 1 \mu\text{m}$ apertures. Further, this patent fails to teach or suggest the use of conductive polymers in the manufacture of integrated circuits. In fact, the conductive polymer films of Rapoport et al. are approximately $20 \mu\text{m}$ thick, see column 6, lines 14-16. Such a thick layer is not suitable for use in the manufacture of integrated circuits using substrates having apertures of $\leq 1 \mu\text{m}$.

One skilled in the art would have no motivation to combine Rapoport et al. with Chen. As described above, Chen is directed only to enhancing seed layers with a *metal or metal alloy* using an electroplating bath. Nothing in Chen would lead one skilled in the art to substitute a polymer for such metal or metal alloy. Rapoport et al. are not directed to the manufacture of integrated circuits. The Rapoport patent discloses films of silver filled polymers that are far thicker than the dimensions of the apertures used in integrated circuit manufacture. Thus, one

reading Rapoport et al. would not be lead to use silver filled polymers in the manufacture of integrated circuits.' Applicant submits that the Examiner has not made out a prima facie case of obviousness and respectfully requests that this rejection be withdrawn.

Claims 5 and 31 have been rejected under 35 USC § 103(a) as being unpatentable over Datta et al. (US 2002/0064592) or Chen (US 6,277,263) in combination with either Rapoport et al. (US 5,298,687) further in view of Jonas (?) or Cloots (?). Applicant respectfully traverses. Applicant notes that in the Official Action this rejection was incomplete. Nonetheless, Applicant will address all the cited references.

The Datta et al. publication is discussed above. Accordingly, Applicants submit that this publication is not prior art and should be removed as a reference.

The Chen and Rapoport patents are discussed above, both individually and in combination.

Neither Jonas et al. nor Cloots et al. fill the deficiencies of Chen, Rapoport or a combination of these references. The Jonas patent is directed to a screen printing paste containing a conductive polymer. Nothing in this patent teaches or suggests the use of such screen printing paste in the manufacture of integrated circuits. Further, nothing in this patent teaches or suggests the use of such conductive polymers to deposit or repair a seed layer, particularly on a substrate having $\leq 1 \mu\text{m}$ apertures.

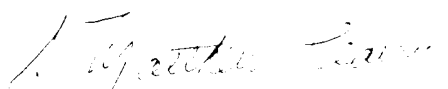
Cloots et al. are directed to a method of producing an electrode pattern in a conductive polymer. This patent neither teaches nor suggests the use of conductive polymers in the manufacture of integrated circuits. Further, nothing in this patent teaches or suggests the use of such conductive polymers to deposit or repair a seed layer, particularly on a substrate having $\leq 1 \mu\text{m}$ apertures.

As discussed above, One skilled in the art would have no motivation to combine Rapoport et al. with Chen. Chen is only directed to enhancing seed layers with a *metal or metal alloy* using an electroplating bath. The Chen patent would not lead one skilled in the art to substitute a polymer for such metal or metal alloy. The Rapoport patent is not directed to the manufacture of integrated circuits and uses films of silver filled polymers that are far thicker than

the dimensions of the apertures used in integrated circuit manufacture. There is no motivation for combining the Jonas and/or Cloots references with Chen and/or Rapoport. Jonas et al. discloses only screen printing paste containing conductive polymers and fails to teach or suggest integrated circuits. Specifically, the Jonas patent neither teaches nor suggests depositing or enhancing seed layers used in the manufacture of integrated circuits. Cloots et al. do not fill the deficiencies of any of the above references, either alone or in any combination. This patent fails to teach or suggest the applicability of conductive polymers to integrated circuits, particularly in depositing or repairing seed layers used in the manufacture of integrated circuits. There is nothing in Chen, Rapoport, Jonas or Cloots references, individually or in any combination that would fairly suggest Applicant's claimed invention. Even if one were to combine Rapoport with Jonas and/or Cloots, there is nothing in this combination that fairly suggests the use of conductive polymers in the manufacture of integrated circuits, specifically where a substrate has apertures $\leq 1 \mu\text{m}$. Accordingly, Applicant respectfully submits that the Examiner has not made out a prima facie case of obviousness and respectfully requests that this rejection be withdrawn.

In view of the foregoing, Applicants respectfully request favorable reconsideration in the form of a notice of allowance.

Respectfully submitted,



S. Matthew Cairns, Ph.D.

Attorney for Applicant

Registration No. 42,378

Telephone No: (508) 229-7545

Facsimile No.: (508) 787-4730

c/o EDWARDS & ANGELL

PO Box 9169

Boston, MA 02209

Date: